

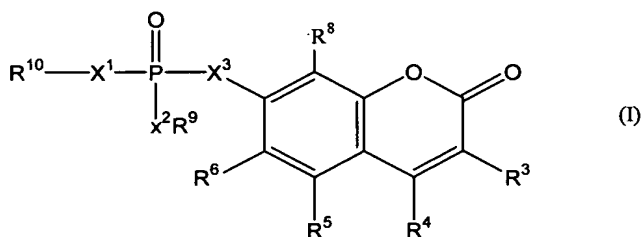
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please cancel claims 1-56 and add the following new claims:

57. (New) A compound of the formula I:



wherein

R<sup>3</sup> is selected from the group consisting of H, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula  $-(C=O)NR^1R^2$  where R<sup>1</sup> and R<sup>2</sup> are independently H, alkyl having 1-6 carbon atoms, an aryl, or R<sup>1</sup> and R<sup>2</sup> taken together form a saturated 5- or 6-membered ring having the formula  $-(CH_2)_2-M-(CH_2)_2-$  where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine  $-NR^7-$  where R<sup>7</sup> is H or alkyl having 1-6 carbon atoms;

R<sup>4</sup> is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C<sub>1</sub>-C<sub>6</sub> alkylamino, C<sub>1</sub>-C<sub>6</sub> acylamino, C<sub>1</sub>-C<sub>6</sub> alkylamido, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, halomethyl, C<sub>1</sub>-C<sub>6</sub> alkylthio, C<sub>5</sub>-C<sub>8</sub> cycloalkyl, C<sub>1</sub>-C<sub>6</sub> haloalkyl, C<sub>5</sub>-C<sub>8</sub> halocycloalkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>5</sub>-C<sub>8</sub> hydroxycycloalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkoxy carbonyl, C<sub>2</sub>-C<sub>6</sub> alkoxy carbonyl C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkyl, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>6</sub> cyanoalkyl, phosphono C<sub>1</sub>-C<sub>6</sub> alkyl, phosphoryl C<sub>1</sub>-C<sub>6</sub> alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R<sup>5</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkoxy;

R<sup>9</sup> and R<sup>10</sup> are ethyl;

R<sup>6</sup> and R<sup>8</sup> are halo; and

X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are independently O or S.

58. (New) The compound of claim 57, wherein R<sup>4</sup> is selected from the group consisting of H, cyano, sulfomethyl, salt of sulfomethyl, aryl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, and C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl.

59. (New) The compound of claim 58, wherein R<sup>4</sup> is selected from the group consisting of C<sub>1</sub>-C<sub>6</sub> alkyl.

60. (New) The compound of claim 59, wherein R<sup>4</sup> is methyl.

61. (New) The compound of claim 57, wherein R<sup>6</sup> and R<sup>8</sup> are fluoro.

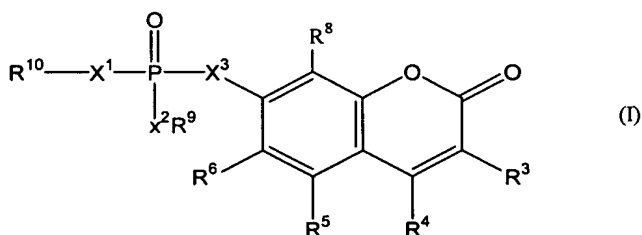
62. (New) The compound of claim 57, wherein R<sup>9</sup> and R<sup>10</sup> are ethyl, R<sup>4</sup> is methyl, and R<sup>6</sup> and R<sup>8</sup> are fluoro.

63. (New) The compound of claim 57, wherein X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are O.

64. (New) The compound of claim 57, wherein X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are S.

65. (New) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme in a biological fluid, which contains at least organophosphatases and phosphatases, said method comprising:

(a) contacting the fluid with a compound of the formula I:



wherein

R<sup>3</sup> is selected from the group consisting of H, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula  $-(C=O)NR^1R^2$  where R<sup>1</sup> and R<sup>2</sup> are independently H, alkyl having 1-6 carbon atoms, an aryl, or R<sup>1</sup> and R<sup>2</sup> taken together form a saturated 5- or 6-membered ring having the formula  $-(CH_2)_2-M-(CH_2)_2-$  where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine  $-NR^7-$  where R<sup>7</sup> is H or alkyl having 1-6 carbon atoms;

R<sup>4</sup> is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C<sub>1</sub>-C<sub>6</sub> alkylamino, C<sub>1</sub>-C<sub>6</sub> acylamino, C<sub>1</sub>-C<sub>6</sub> alkylamido, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, halomethyl, C<sub>1</sub>-C<sub>6</sub> alkylthio, C<sub>5</sub>-C<sub>8</sub> cycloalkyl, C<sub>1</sub>-C<sub>6</sub> haloalkyl, C<sub>5</sub>-C<sub>8</sub> halocycloalkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>5</sub>-C<sub>8</sub> hydroxycycloalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkyl, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>6</sub> cyanoalkyl, phosphono C<sub>1</sub>-C<sub>6</sub> alkyl, phosphoryl C<sub>1</sub>-C<sub>6</sub> alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R<sup>5</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkoxy;

R<sup>9</sup> and R<sup>10</sup> are ethyl;

R<sup>6</sup> and R<sup>8</sup> are halo or hydrogen; and

X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

66. (New) The method of claim 65, wherein the organophosphatase is paraoxonase.

67. (New) The method of claim 65, wherein the organophosphatase is OPH.

68. (New) The method of claim 65, wherein R<sup>9</sup> and R<sup>10</sup> are ethyl, R<sup>4</sup> is methyl, R<sup>6</sup> and R<sup>8</sup> are fluoro, and X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are O.

69. (New) The method of claim 65, wherein  $X^1$  and  $X^2$  are O,  $X^3$  is S,  $R^6$  and  $R^8$  are H;  $R^9$  and  $R^{10}$  are ethyl, and  $R^4$  is methyl.

70. (New) The method of claim 65, wherein the fluid is a biological fluid.

71. (New) The method of claim 70, wherein the biological fluid is selected from the group consisting of blood, blood-derived compositions, serum, cerebrospinal fluid, urine, saliva, milk, ductal fluid, tears, semen, cell or tissue extracts, culture medium from the expression of paraoxonase or mutations of paraoxonase, samples arising from the fractionation of paraoxonase or HDL from biological samples.

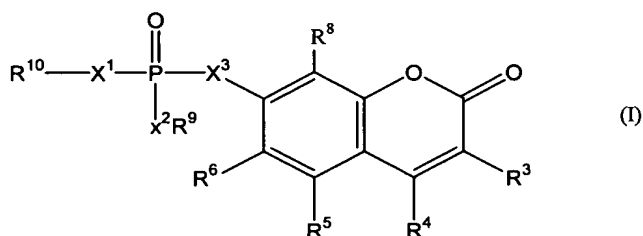
72. (New) The method of claim 71, wherein the cell or tissue extract is of brain, artery, vein or gland.

73. (New) The method of claim 70, wherein the fluid is an environmental fluid.

74. (New) The method of claim 73, wherein the environmental fluid is an extract of soil, water, or swab.

75. (New) A method for selectively detecting an organophosphatase in a sample suspected to contain an organophosphatase and a phosphatase comprising:

(a) contacting the sample with a compound of the formula I:



wherein

$R^3$  is selected from the group consisting of H, cyano,  $C_1$ - $C_6$  alkyl,  $C_1$ - $C_6$  perfluoroalkyl,  $C_2$ - $C_6$  alkenyl,  $C_2$ - $C_6$  alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula  $-(C=O)NR^1R^2$  where  $R^1$  and  $R^2$  are independently H, alkyl having 1-6 carbon atoms, an aryl, or  $R^1$  and  $R^2$  taken together form a saturated 5- or 6-

membered ring having the formula  $-(CH_2)_2-M-(CH_2)_2-$  where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine  $-NR^7-$  where  $R^7$  is H or alkyl having 1-6 carbon atoms;

$R^4$  is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino,  $C_1$ - $C_6$  alkylamino,  $C_1$ - $C_6$  acylamino,  $C_1$ - $C_6$  alkylamido,  $C_1$ - $C_6$  alkyl,  $C_1$ - $C_6$  alkoxy,  $C_1$ - $C_6$  perfluoroalkyl, halomethyl,  $C_1$ - $C_6$  alkylthio,  $C_5$ - $C_8$  cycloalkyl,  $C_1$ - $C_6$  haloalkyl,  $C_5$ - $C_8$  halocycloalkyl,  $C_1$ - $C_6$  hydroxyalkyl,  $C_5$ - $C_8$  hydroxycycloalkyl,  $C_1$ - $C_6$  alkoxy  $C_1$ - $C_6$  alkyl,  $C_2$ - $C_6$  alkoxycarbonyl,  $C_2$ - $C_6$  alkoxycarbonyl  $C_1$ - $C_6$  alkyl, carboxy  $C_1$ - $C_6$  alkyl, carboxy  $C_1$ - $C_6$  alkoxy, dicarboxy  $C_1$ - $C_6$  alkyl, dicarboxy  $C_1$ - $C_6$  alkoxy,  $C_2$ - $C_6$  cyanoalkyl, phosphono  $C_1$ - $C_6$  alkyl, phosphoryl  $C_1$ - $C_6$  alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and  $C_2$ - $C_6$  alkenyl,  $C_2$ - $C_6$  alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

$R^5$  is H or  $C_1$ - $C_6$  alkoxy;

$R^9$  and  $R^{10}$  are ethyl;

$R^6$  and  $R^8$  are halo or hydrogen; and

$X^1$ ,  $X^2$ , and  $X^3$  are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

76. (New) The method of claim 75, wherein the organophosphatase is paraoxonase.

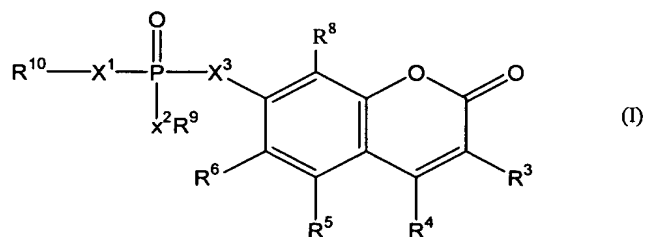
77. (New) The method of claim 75, wherein the organophosphatase is OPH.

78. (New) The method of claim 75, wherein  $R^9$  and  $R^{10}$  are ethyl,  $R^4$  is methyl,  $R^6$  and  $R^8$  are fluoro, and  $X^1$ ,  $X^2$ , and  $X^3$  are O.

79. (New) The method of claim 75, wherein  $X^1$  and  $X^2$  are O,  $X^3$  is S,  $R^6$  and  $R^8$  are H;  $R^9$  and  $R^{10}$  are ethyl, and  $R^4$  is methyl.

80. (New) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme immobilized on a support, which comprises at least organophosphatases and phosphatases, said method comprising:

(a) contacting the support with a compound of the formula I:



wherein

R<sup>3</sup> is selected from the group consisting of H, cyano, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula  $-(C=O)NR^1R^2$  where R<sup>1</sup> and R<sup>2</sup> are independently H, alkyl having 1-6 carbon atoms, an aryl, or R<sup>1</sup> and R<sup>2</sup> taken together form a saturated 5- or 6-membered ring having the formula  $-(CH_2)_2-M-(CH_2)_2-$  where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine  $-NR^7-$  where R<sup>7</sup> is H or alkyl having 1-6 carbon atoms;

R<sup>4</sup> is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C<sub>1</sub>-C<sub>6</sub> alkylamino, C<sub>1</sub>-C<sub>6</sub> acylamino, C<sub>1</sub>-C<sub>6</sub> alkylamido, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, halomethyl, C<sub>1</sub>-C<sub>6</sub> alkylthio, C<sub>5</sub>-C<sub>8</sub> cycloalkyl, C<sub>1</sub>-C<sub>6</sub> haloalkyl, C<sub>5</sub>-C<sub>8</sub> halocycloalkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>5</sub>-C<sub>8</sub> hydroxycycloalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkyl, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>6</sub> cyanoalkyl, phosphono C<sub>1</sub>-C<sub>6</sub> alkyl, phosphoryl C<sub>1</sub>-C<sub>6</sub> alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R<sup>5</sup> is H or C<sub>1</sub>-C<sub>6</sub> alkoxy;

R<sup>9</sup> and R<sup>10</sup> are ethyl;

R<sup>6</sup> and R<sup>8</sup> are halo or hydrogen; and

X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

81. (New) The method of claim 80, wherein the organophosphatase is paraoxonase.

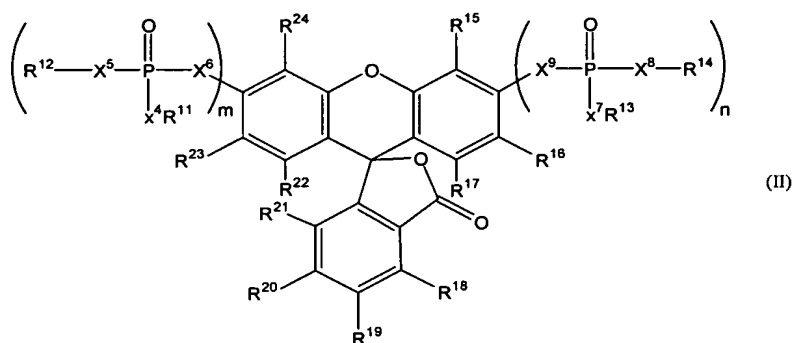
82. (New) The method of claim 80, wherein the organophosphatase is OPH.

83. (New) The method of claim 80, wherein the support is a membrane, resin, biosensor, microtiter plate, nanotube or dipstick.

84. (New) The method of claim 80, wherein R<sup>9</sup> and R<sup>10</sup> are ethyl, R<sup>4</sup> is methyl, R<sup>6</sup> and R<sup>8</sup> are fluoro, and X<sup>1</sup>, X<sup>2</sup>, and X<sup>3</sup> are O.

85. (New) The method of claim 80, wherein X<sup>1</sup> and X<sup>2</sup> are O, X<sup>3</sup> is S, R<sup>6</sup> and R<sup>8</sup> are H; R<sup>9</sup> and R<sup>10</sup> are ethyl, and R<sup>4</sup> is methyl.

86. (New) A compound of the formula II:



wherein

R<sup>11</sup>-R<sup>14</sup> are selected from the group consisting of C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>5</sub>-C<sub>8</sub> cycloalkyl, C<sub>1</sub>-C<sub>6</sub> haloalkyl, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, and C<sub>2</sub>-C<sub>6</sub> alkynyl, and aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidino;

X<sup>4</sup>- X<sup>9</sup> are independently O or S;

n and m are 0 or 1 but m and n cannot be 0 simultaneously; and

R<sup>15</sup>- R<sup>24</sup> can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent compound.

87. (New) The compound of claim 86, wherein the hydrolysis takes place at the P-X<sup>6</sup> and/or P-X<sup>9</sup> bonds.

88. (New) The compound of claim 86, wherein m and n are 1.

89. (New) The compound of claim 86, wherein R<sup>15</sup>- R<sup>24</sup> are independently selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, a salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C<sub>1</sub>-C<sub>6</sub> alkylamino, C<sub>1</sub>-C<sub>6</sub> acylamino, C<sub>1</sub>-C<sub>6</sub> alkylamido, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylthio, C<sub>5</sub>-C<sub>8</sub> cycloalkyl, C<sub>1</sub>-C<sub>6</sub> haloalkyl, C<sub>1</sub>-C<sub>6</sub> perfluoroalkyl, formyl, carboxamide of the formula -(C=O)NR<sup>1</sup>R<sup>2</sup> where R<sup>1</sup> and R<sup>2</sup> are independently H, alkyl having 1-6 carbon atoms, an aryl, or R<sup>1</sup> and R<sup>2</sup> taken together form a saturated 5- or 6-membered ring having the formula -(CH<sub>2</sub>)<sub>2</sub>-M-(CH<sub>2</sub>)<sub>2</sub>- where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine -NR<sup>7</sup>- where R<sup>7</sup> is H or alkyl having 1-6 carbon atoms, an aryl, or R<sup>1</sup> and R<sup>2</sup> taken together form a saturated 5- or 6- membered ring having the formula -(CH<sub>2</sub>)<sub>2</sub>-M-(CH<sub>2</sub>)<sub>2</sub>- where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine -NR<sup>7</sup>- where R<sup>7</sup> is H or alkyl having 1-6 carbon atoms, C<sub>5</sub>-C<sub>8</sub> halocycloalkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>5</sub>-C<sub>8</sub> hydroxycycloalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl, C<sub>2</sub>-C<sub>6</sub> alkoxycarbonyl C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkyl, carboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkyl, dicarboxy C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>6</sub> cyanoalkyl, phosphono C<sub>1</sub>-C<sub>6</sub> alkyl, phosphoryl C<sub>1</sub>-C<sub>6</sub> alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo,



amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidino.

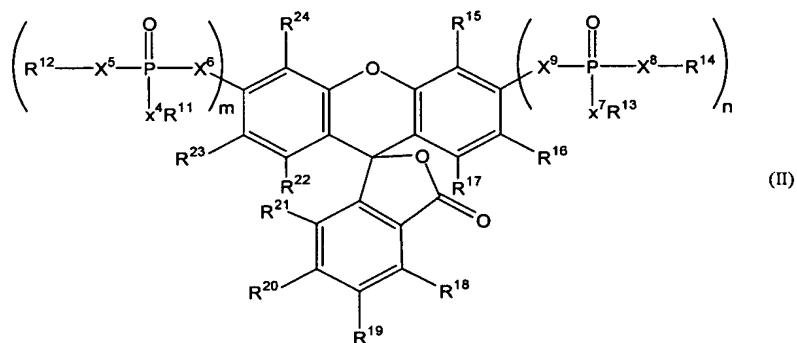
90. (New) The compound of claim 86, wherein  $R^{11}$ - $R^{14}$  are independently selected from the group consisting of  $C_1$ - $C_6$  alkyl,  $C_2$ - $C_6$  alkenyl,  $C_2$ - $C_6$  alkynyl, aryl, and heteroaryl.

91. (New) The compound of claim 86, wherein  $R^{11}$ - $R^{14}$  are independently selected from the group consisting of  $C_1$ - $C_6$  alkyl,  $C_2$ - $C_6$  alkenyl, and  $C_2$ - $C_6$  alkynyl.

92. (New) The compound of claim 86, wherein  $R^{11}$ - $R^{14}$  groups are independently selected from the group consisting of  $C_1$ - $C_6$  alkyl.

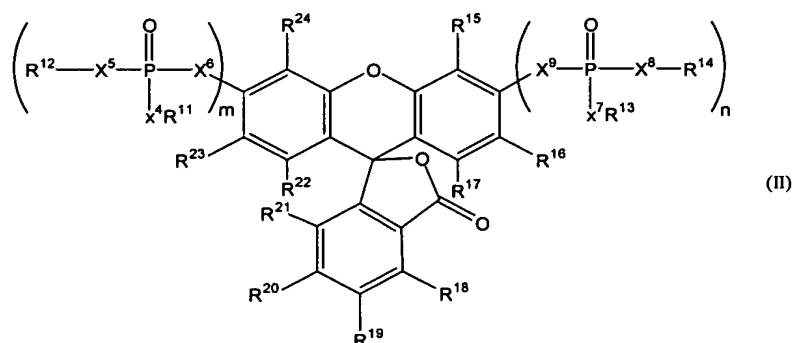
93. (New) The compound of claim 86, wherein  $R^{11}$ - $R^{14}$  is ethyl.

94. (New) A compound of formula II



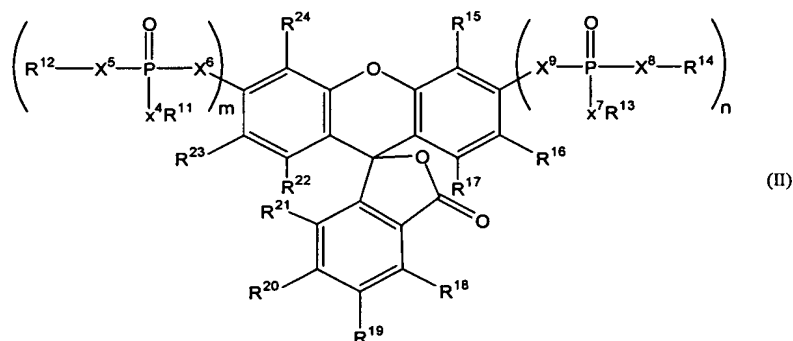
wherein  $X^4$ - $X^9$  are O,  $R^{15}$ - $R^{24}$  are H,  $R^{11}$ - $R^{14}$  are ethyl; and m and n are 1.

95. (New) A compound of formula II:



wherein  $X^4$ ,  $X^5$ ,  $X^7$ , and  $X^8$  are O;  $X^6$  and  $X^9$  are S;  $R^{15}$ - $R^{24}$  are H;  $R^{11}$ - $R^{14}$  are ethyl; and  $m$  and  $n$  are 1.

96. (New) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme in a fluid, which contains at least organophosphatases and phosphatases, said method comprising:



(a) contacting the fluid with a compound of the formula II:

wherein  $R^{11}$ - $R^{14}$  are selected from the group consisting of H and groups or atoms other than H,  $X^4$ - $X^9$  are independently O or S,  $n$  and  $m$  are 0 or 1 but  $m$  and  $n$  cannot be 0 simultaneously, and  $R^{15}$ - $R^{24}$  can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent product;

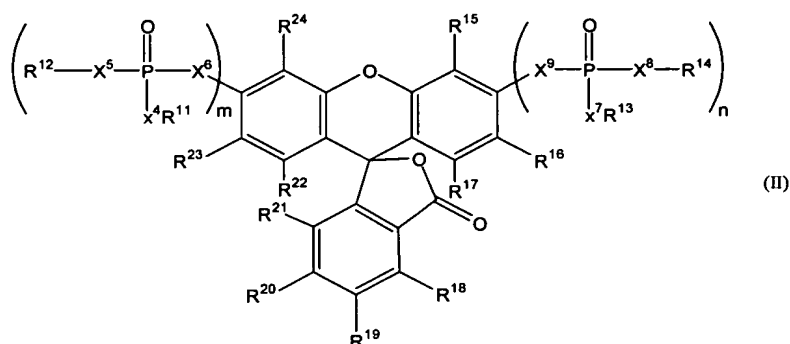
(b) collecting the fluorescent product;

(c) measuring the fluorescence of a fluorescent product formed during the contacting; and

- (d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

97. (New) A method for selectively detecting an organophosphatase enzyme in a sample suspected to contain an organophosphatase and a phosphatase comprising

- (a) contacting the sample with a compound of the formula II:

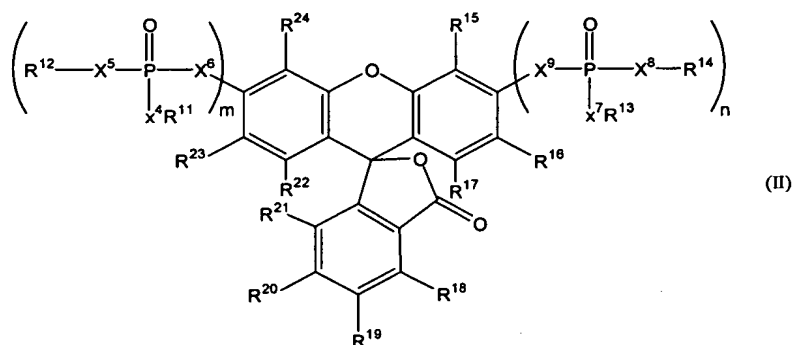


wherein R<sup>11</sup>-R<sup>14</sup> are selected from the group consisting of H and groups or atoms other than H, X<sup>4</sup>-X<sup>9</sup> are independently O or S, n and m are 0 or 1 but m and n cannot be 0 simultaneously, and R<sup>15</sup>-R<sup>24</sup> can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent product;

- (b) collecting the fluorescent product;
- (c) measuring the fluorescence of a fluorescent product formed during the contacting; and
- (d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

98. (New) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme immobilized on a support comprising:

- (a) contacting the support with a compound of the formula II:



wherein  $R^{11}$ - $R^{14}$  are selected from the group consisting of H and groups or atoms other than H,  $X^4$ - $X^9$  are independently O or S,  $n$  and  $m$  are 0 or 1 but  $m$  and  $n$  cannot be 0 simultaneously, and  $R^{15}$ - $R^{24}$  can be H or any substituent so long as the compound of formula II upon provides a fluorescent product;

- (b) collecting the fluorescent product;
- (c) measuring the fluorescence of a fluorescent product formed during the contacting; and
- (d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.